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Double-Cropped Field Pea Crop Rotation Study

James A. Fawcett
Iowa State University, fawcett@iastate.edu

Tom Miller
Iowa State University

Kevin Van Dee
Iowa State University

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Abstract
Farmers are continually searching for a third crop to complement the corn-soybean rotation. Field peas can be substituted for most of the soybean meal in swine rations and is more economical than soybean meal, so there is a large potential market for field peas in Iowa. Field peas are a short-season crop, which makes double cropping a potential possibility.

Disciplines
Agricultural Science | Agriculture

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Jim Fawcett, extension field agronomist
Tom Miller, extension swine specialist
Kevin Van Dee, farm superintendent

Introduction

Farmers are continually searching for a third crop to complement the corn-soybean rotation. Field peas can be substituted for most of the soybean meal in swine rations and is more economical than soybean meal, so there is a large potential market for field peas in Iowa. Field peas are a short-season crop, which makes double cropping a potential possibility.

Materials & Methods

The study consists of three crop rotations that were established in 2005 and were continued through 2008. One of the crop rotations includes field peas double cropped after winter wheat and another rotation includes soybeans or milo double cropped after field peas. These rotations are being compared with the standard corn-soybean rotation. The three crop rotations are; 1) corn-soybean, 2) corn-field peas/soybean (milo), and 3) corn-soybean-winter wheat/field peas. In 2007, the double cropped soybeans were replaced with two double cropped milo varieties, TR418 and LM5001. Each crop in each rotation was grown in every year of the trial.

Two field pea varieties were grown in rotation 2, and three field pea varieties were used in rotation 3 until 2008 when one variety was used. In rotation 3, three planting dates were used in 2005, two in 2006, and one in 2007 and 2008. All treatments were replicated four times in a randomized complete block design. All plots were 20 ft wide by 40 ft long and were machine harvested for yield. Planting and harvest dates are summarized in Table 1.

Results and Discussion

The field pea followed by double-cropped soybean rotation showed some promise in 2005, despite the hot, dry summer. Both pea varieties yielded 52 bushels/acre. Pea yields were considerably less in 2006–2008, probably due to the later planting in 2006 and 2008, the wet conditions in 2007 and 2008, and hot weather during flowering in 2006 and 2007. Both varieties had stands of more than 300,000 plants/acre in 2005, which was the goal, but stands were less in most other years.

Despite the upper leaves of the milo being damaged by an early frost in mid-September in 2007, the milo yields were respectable, with LM5001 yielding 92 bushels/acre and the TR418 yielding 80 bushels/acre. Milo yields were less in 2008, probably due to the later planting. Yields for all crops are shown in Table 2.

Poor yields occurred in all four years with all field pea varieties and planting dates when the peas were planted in July following winter wheat. Part of the poor yield was likely due to the poorer stand established, probably from the dry soil conditions at planting time (Table 3). Temperatures were also warmer than normal in August in 2005–2007 when the peas were blooming, which would have reduced yields. There also was more powdery mildew with the peas planted in July.

Although feeding trials showed that field peas can be included successfully in swine rations, it is possible that Iowa's climate is too warm and wet to consistently get good pea yields and too short for double cropping.

Acknowledgements

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Table 1. Planting and harvest dates for field peas and double-cropped soybeans and milo.

	2005	2006	2007	2008
Spring pea planting date	3/28	4/11	3/20	4/7
Spring pea harvest date	7/5	7/6	7/3	7/14
Double-cropped soybean planting date	7/5	7/7	---	---
Double-cropped milo planting date	---	---	7/3	7/15
Summer pea planting date	7/11	-	-	-
	7/18	7/20	7/23	7/23
	7/28	8/1	-	
Double-cropped soybean harvest date	10/26	10/25	-	-
Double-cropped milo harvest date	-	-	10/30	11/20
Summer pea harvest date	10/26	NH*	NH*	NH*

*Not harvested – very few harvestable peas.

Table 2. Crop yields in the three rotations and four years in bushels/acre.

	2005	**2006**	**2007**	**2008**	**Mean**
Rotation 1					
Corn	176	194	204	234	202
Soybean	54	55	55	58	56
Rotation 2					
Corn	169	188	199	214	193
Field pea	52	25	35	34	37
Soybean after pea	9	21	--	--	15
Milo after pea	--	--	86	38	62
Rotation 3					
Corn	162	197	220	234	203
Soybean	62	55	53	58	57
Wheat	74	88	56	71	72
Field pea after wheat	13	0	0	0	3

Table 3. Field pea yields and stand counts in 2005–2008.

Pea Variety	Spring peas		Summer peas	
2005	Stand (thousands/A)	Yield (bu/A)	Stand (thousands/A)	Yield (bu/A)
WFP0097	337	52	224	11
Eclipse	307	52	189	14
Admiral	----	--	186	15
2006				
Striker	181	21	171	0
Admiral	183	29	198	0
Midas	----	--	209	0
2007				
Admiral	281	33	106	0
Circus	286	37	76	0
Marque	---	--	76	0
2008				
Admiral	220	34	350	0
Marque	403	34		